## SEQUENCE LISTING

<110> Regents of the University of Minnesota et al.

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<120> Streptococcal C5a peptidase vaccine

<130> 600.450WO1

10 <150> US 09/206,898

<151> 1998-12-07

<150> US 08/589,756

<151> 1996-01-22

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<160> 23

<170> FastSEQ for Windows Version 3.0

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<211> 1164

<212> PRT

<213> Streptococcus pyogenes

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Gln Pro Thr Thr Val Ser Glu Glu Val Pro Ser Ser Lys Glu Thr Lys

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.00 105 110

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115 120 125

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	Ile	Asn	Met	Ser	Phe	Gly	Asn	Ala	Ala	Leu	Ala	Tyr	Ala	Asn	Leu	Pro
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	Leu	Thr	Glu	Thr	Ala	Met	Val	Lys	Thr	Asp	Asp	Gln	Gln	Asp	Lys	Glu
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	Asp	Asn	Gln	ı Asp	Lys	Gly	/ Phe	Pro	Ile	Glu	ı Lev	Pro	Asn			Gln
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	Met	Pro	Ala	a Ala	Phe	: Ile	e Ser	Arg	Lys	Ası	Gly	/ Let	Leu	Leu	Lys	Asp
40			435	5				440	)				445	,		

	Asn	Ser	Gln	Lys	Thr	Ile	Thr	Phe	Asn	Ala	Thr	Pro	Lys	Val	Leu	Pro
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	Thr	Ala	Ser	Gly	Thr	Lys	Leu	Ser	Arg	Phe	Ser	Ser	Trp	Gly	Leu	Thi
	465					470					475					480
5	Ala	Asp	Gly	Asn	Ile	Lys	Pro	Asp	Ile	Ala	Ala	Pro	Gly	Gln	Asp	Ile
					485					490					495	
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	Tyr	Glu	Thr	Gln	Tyr	Pro	Asp	Met	Thr	Gln	Ser	Glu	Arg	Leu	Asp	Leı
		530					535					540				
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	Ser	Lys	Asp	Leu	Leu	Ala	Gln	Met	Lys	Asn	Gly	Tyr		Leu	Glu	Gly
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	Phe	Val	Arg	Ile	Lys	Gln	Asp	Pro	Thr	Lys	Glu		Leu	Met	Ser	Ile
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	Pro	Tyr	Ile	Gly	Phe	Arg	Gly	Asp	Phe	Gly	Asn	Leu	Ser	Ala	Leu	
	705					710					715					720
3 <b>5</b>	Lys	Pro	Leu	Tyr	Asp	Ser	Lys	Asp	Gly	Ser	Ser	Tyr	Tyr	His		Glu
					725					730					735	
	Ile	Ser	Asp	Ala	Lys	Asp	Gln	Leu		Gly	Asp	Gly	Leu	Gln	Phe	Тут
				740					745					750	•	
	Ala	Leu	Lys	Asn	Asp	Phe				Thr	Thr	Glu		Asn	Pro	Trp
40			755					760					765			



Thr Ile Ile Asn Val Val Lys Glu Gly Val Glu Asn Ile Glu Asp Ile Glu Ser Ser Glu Ile Thr Glu Thr Ile Phe Ala Gly Thr Phe Ala Lys 5 Gln Asp Asp Asp Arg His Tyr Tyr Ile His Arg His Ala Asn Gly Lys Pro Tyr Ala Ala Ile Ser Pro Asn Gly Asp Gly Asn Arg Asp Tyr Val Gln Phe His Gly Thr Phe Leu Arg Asn Ala Lys Asn Leu Val Ala Glu Val Leu Asp Lys Glu Gly Asn Val Val Trp Thr Ser Glu Val Thr Glu Gln Val Val Lys Asn Tyr Asn Asn Asp Leu Ala Ser Thr Leu Gly Ser 15 Thr Arg Phe Glu Ile Ser Arg Trp Asp Gly Lys Asp Lys Asp Ala Lys Val Val Ala Asn Gly Thr Tyr Thr Tyr Arg Val Arg Tyr Thr Pro Ile Ser Ser Gly Ala Lys Glu Gln His Thr Asp Phe Asp Val Ile Val Asp Asn Thr Thr Pro Glu Val Ala Thr Ser Ala Thr Phe Ser Thr Glu Asp Arg Arg Leu Thr Leu Ala Ser Lys Pro Gln Thr Ser Gln Pro Val Tyr 25 Arg Glu Arg Ile Ala Tyr Thr Tyr Met Asp Glu Asp Leu Pro Thr Thr Glu Tyr Ile Ser Pro Asn Glu Asp Gly Thr Phe Thr Leu Pro Glu Glu Ala Glu Thr Met Glu Gly Ala Thr Val Pro Leu Lys Met Ser Asp Phe Thr Tyr Val Val Glu Asp Met Ala Gly Asn Ile Thr Tyr Thr Pro Val Thr Lys Leu Leu Glu Gly His Ser Asn Lys Pro Glu Gln Asp Gly Ser 35 Asp Gln Ala Pro Asp Lys Pro Glu Thr Lys Pro Glu Gln Asp Gly Ser Asp Gln Ala Pro Asp Lys Lys Pro Glu Thr Lys Pro Gly Gln Asp Gly Ser Gly Gln Thr Pro Asp Lys Pro Glu Thr Lys Pro Glu Lys 



Asp Ser Ser Gly Gln Thr Pro Gly Lys Thr Pro Gln Lys Gly Gln Pro 1090 1095 Ser Arg Thr Leu Glu Lys Arg Ser Ser Lys Arg Ala Leu Ala Thr Lys 1110 1115 1120 5 Ala Ser Thr Arg Asp Gln Leu Pro Thr Thr Asn Asp Lys Asp Thr Asn 1125 1130 Arg Leu His Leu Lys Leu Val Met Thr Thr Phe Phe Leu Gly Leu 1140 1145 1150 Val Ala His Ile Phe Lys Thr Lys Arg Thr Glu Asp 10 1155 1160 <210> 2 <211> 1167 <212> PRT <213> Streptococcus pyogenes <400> 2 Leu Arg Lys Lys Gln Lys Leu Pro Phe Asp Lys Leu Ala Ile Ala Leu 1 5 10 20 Met Ser Thr Ser Ile Leu Leu Asn Ala Gln Ser Asp Ile Lys Ala Asn 25 20 Thr Val Thr Glu Asp Thr Pro Val Thr Glu Gln Ala Val Glu Thr Pro 40 45 Gln Pro Thr Ala Val Ser Glu Glu Val Pro Ser Ser Lys Glu Thr Lys 60 Thr Pro Gln Thr Pro Asp Asp Ala Glu Glu Thr Ile Ala Asp Asp Ala 70 Asn Asp Leu Ala Pro Gln Ala Pro Ala Lys Thr Ala Asp Thr Pro Ala 85 90 30 Thr Ser Lys Ala Thr Ile Arg Asp Leu Asn Asp Pro Ser Gln Val Lys 100 105 Thr Leu Gln Glu Lys Ala Gly Lys Gly Ala Gly Thr Val Val Ala Val 120 Ile Asp Ala Gly Phe Asp Lys Asn His Glu Ala Trp Arg Leu Thr Asp Lys Thr Lys Ala Arg Tyr Gln Ser Lys Glu Asp Leu Glu Lys Ala Lys 150 155 Lys Glu His Gly Ile Thr Tyr Gly Glu Trp Val Asn Asp Lys Val Ala 165 170

40 Tyr Tyr His Asp Tyr Ser Lys Asp Gly Lys Thr Ala Val Asp Gln Glu



				180					185					190		
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	Thr	Lys	Glu	Pro	Tyr	Arg	Leu	Glu	Gly	Ala	Met	Pro	Glu	Ala	Gln	Lev
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	Asp	Glu	Thr	Lys	Lys	Ala	Phe	Asp	Tyr	Ala	Lys	Ser	ГÀг	Gly	Val	Sei
			275					280					285			
	Ile	Val	Thr	Ser	Ala	Gly	Asn	Asp	Ser	Ser	Phe	Gly	Gly	Lys	Thr	Arç
15		290					295					300				
	Leu	Pro	Leu	Ala	Asp	His	Pro	Asp	Tyr	Gly	Val	Val	Gly	Thr	Pro	Ala
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	Ala	Ala	Asp	Ser		Leu	Thr	Val	Ala		Tyr	Ser	Pro	Asp		Glr
					325					330					335	
20	Leu	Thr	Glu		Ala	Met	Val	Lys		Asp	Asp	Gln	Gln		Lys	Glu
				340					345					350		
	Met	Pro		Leu	ser	Thr	Asn	_	Phe	Glu	Pro	Asn	_	Ala	Tyr	Asp
			355	_ •	_			360			_	_	365	_	_	
	Tyr		Tyr	Ala	Asn	Arg		Met	Lys	GIu	Asp	ā	Phe	Lys	Asp	Val
25	_	370	•	<b>-</b> 1 -	27.	*	375	<b>01</b>	7	<b>03</b>	3	380	3	Dh -	<b>T .</b>	2
	• •	GIY	гÀг	Пе	Ala		116	GIU	Arg	GIY	Asp	шe	Asp	Pne	ьуs	_
	385	*** 1	21-	B	77.	390	T	7 l n	<b>C1</b>	71-	395	G1	17.07	T 0	71.	400
	rys	vai	AIA	ASI		гуѕ	гуя	Ala	-	410	Val	GIY	vai	ьец	415	TYL
3.0	2	3	C1-	7.00	405	C111	Dho	Dro				Dro	N.a.n.	นาไ		C1-
30	Asp	ASN	GIN	420	гаг	GIÀ	Pne	PIO	425	Giu	Leu	Pro	ASII		Asp	GII.
	Wo.	Dwa	717		Dho	Tle	Ser	λτα		λαπ	Gly	Lou	T OU	430	Tare	) cr
	Met	PIO	435	AIA	FIIC	116	261	440	пåэ	ASP	GIY	nea	445	Бец	пуs	Mar
	705	Dro		Lvc	Thr	Tla	Thr		λαη	7 l a	Thr	Dro		Wa l	Len	Dro
2 5	ASII		GIII	БУЗ	III	116	455	FIIC	ASII	Ala	1111	460	цуs	Val	Leu	FIC
35	mp ~	450	C0~	C111	Thr	Tue		Car	720	Dho	Ser		Trn	Clv	Leu	The
		на	Sei	GIY	1111	470	пец	261	Arg	FILE		261	ırp	GIY	Dea	
	465	7 c~	G1.	λου	Tla		Dro	Aer.	Tla	- ומ	475 Ala	Dro	Glv	G] n	λον	480
	WIG	wsb	GIY	ASII	485	БУБ	FIU	vah	116	490	MIG	ETO	Gry	3111	495	116
40	Len	865	Ser	(7 a 1		Δen	Δen	Lve	ጥኒም		Lvs	I.e.i	Ser	Gly		Ser
- LJ	$\mu = \nu$	-J C: I		v	~~~				4 Y 4	~~~	~~~			- × ×		



				500					505					510		
	Met	Ser	Ala	Pro	Leu	Val	Ala	Gly	Ile	Met	Gly	Leu	Leu	Gln	Lys	Gln
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			755					760					765			
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	785					790					795					800
			Asp	Asp	Ser	His	Tyr	Туг	Ile	His	Arg	His	Ala	Asn	Gly	Glu
		•	-	_	805					810					815	
	D	m		- ר ה	Tle	Ser	Pro	Asn	Glv	Asp	Glv	Asn	Arq	Asp	Tyr	· va:

Gln Phe Gln Gly Thr Phe Leu Arg Asn Ala Lys Asn Leu Val Ala Glu Val Leu Asp Lys Glu Gly Asn Val Val Trp Thr Ser Glu Val Thr Glu Gln Val Val Lys Asn Tyr Asn Asn Asp Leu Ala Ser Thr Leu Gly Ser Thr Arg Phe Glu Lys Thr Arg Trp Asp Gly Lys Asp Lys Asp Gly Lys 10 Val Val Ala Asn Gly Thr Tyr Thr Tyr Arg Val Arg Tyr Thr Pro Ile Ser Ser Gly Ala Lys Glu Gln His Thr Asp Phe Asp Val Ile Val Asp Asn Thr Thr Pro Glu Val Ala Thr Ser Ala Thr Phe Ser Thr Glu Asp Arg Arg Leu Thr Leu Ala Ser Lys Pro Lys Thr Ser Gln Pro Val Tyr Arg Glu Arg Ile Ala Tyr Thr Tyr Met Asp Glu Asp Leu Pro Thr Thr 20 Glu Tyr Ile Ser Pro Asn Glu Asp Gly Thr Phe Thr Leu Pro Glu Glu Ala Glu Thr Met Glu Gly Ala Thr Val Pro Leu Lys Met Ser Asp Phe Thr Tyr Val Val Glu Asp Met Ala Gly Asn Ile Thr Tyr Thr Pro Val Thr Lys Leu Glu Gly His Ser Asn Lys Pro Glu Gln Asp Gly Ser Gly Gln Thr Pro Asp Lys Lys Pro Glu Ala Lys Pro Glu Gln Asp Gly 30 Ser Asp Gln Ala Pro Asp Lys Lys Pro Glu Ala Lys Pro Glu Gln Asp Gly Ser Gly Gln Thr Pro Asp Lys Lys Pro Glu Thr Lys Pro Glu Lys Asp Ser Ser Gly Gln Thr Pro Gly Lys Thr Pro Gln Lys Gly Gln Pro Ser Arg Thr Leu Glu Lys Arg Ser Ser Lys Arg Ala Leu Ala Thr Lys Ala Ser Thr Arg Asp Gln Leu Pro Thr Thr Asn Asp Lys Asp Thr Asn 40 Arg Leu His Leu Leu Lys Leu Val Met Thr Thr Phe Phe Gly Leu



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	Met	Ser	Thr	Ser	Ile	Leu	Leu	Asn		Gln	Ser	Asp	Ile	Lys	Ala	Asn
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			35					40					45			
	Gln	Pro	Thr	Ala	Val	Ser		Glu	Ala	Pro	Ser		Lys	Glu	Thr	Lys
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		Pro	Gln	Thr	Pro		Asp	Ala	Gly	Glu		Val	Ala	Asp	Asp	
20	65				_	70		_		_	75 		_	_,	_	80
	Asn	Asp	Leu	Ala		Gln	Ala	Pro	Ala		Thr	Ala	Asp	Thr		Ala
		_	_		85		•	•	•	90	•	<b>D</b>	<b>a</b>	a1-	95	*
	Thr	Ser	Lys		Thr	IIe	Arg	Asp		Asn	Asp	Pro	ser	Gln	vaı	ьуs
_	_,	_	<b>~</b> 1	100	*	21-	G3	T	105	71-	<b>01</b>	Th	17.01	110	71-	T
25	Thr	Leu	115	GIU	Lys	АІА	GIY	120	GIY	Ата	GIY	1111	125	Val	Ala	vai
	T10	7.00	-	Clv	Dhe	λen	Luc		uie	Glu	בות	Trn		Leu	Thr	Aen.
	TIE	130	ATG	GIY	FILE	vah	135	ASII	111.5	Gru	AIG	140	n. g	LCu	1111	nsp
	Lvc		LVE	בות	Ara	ጥረታ		Ser	Lve	Glu	Asn		Glu	Lys	Δla	Lvs
2.0	145	1111	Бүз	AIG	n- 9	150	<b>0111</b>	501	2,0	014	155		0.2	-,0		160
, ,		Glu	His	Glv	Ile		Tvr	Glv	Glu	Trp		Asn	Asp	Lys	Val	
	Lys	O1u	1115	O. J	165		- , -	,		170				-1-	175	
	Tvr	Tvr	His	Asp		Ser	Lys	αεA	Glv		Thr	Ala	Val	Asp		Glu
	-1-	- / -		180	- 4 -				185				_	190		
. 5	uic	Gly	Thr		Val	Ser	Glv	Tle		Ser	Glv	Aen	Δla	Pro	Ser	Glu

	Asn	Tyr	Ala	Gln	Ala	Ile	Arg	Asp	Ala	Ile	Asn	Leu	Gly	Ala	Lys	Va]
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	Ile	Asn	Met	Ser	Phe	Gly	Asn	Ala	Ala	Leu	Ala	Tyr	Ala	Asn	Leu	Pro
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	Tyr	Glu	Thr	Gln	Tyr	Pro	Asp	Met	Thr	Pro	Ser	Glu	Arg	Leu	Asp	Leu
	-	530					535					540	_		-	
	Ala	Lys	Lys	Val	Leu	Met	Ser	Ser	Ala	Thr	Ala	Leu	Tyr	Asp	Glu	Asp
	545	-	=										-	-		560

Glu Lys Ala Tyr Phe Ser Pro Arg Gln Gln Gly Ala Gly Ala Val Asp 570 Ala Lys Lys Ala Ser Ala Ala Thr Met Tyr Val Thr Asp Lys Asp Asn 585 580 5 Thr Ser Ser Lys Val His Leu Asn Asn Val Ser Asp Lys Phe Glu Val 600 Thr Val Asn Val His Asn Lys Ser Asp Lys Pro Gln Glu Leu Tyr Tyr 615 Gln Ala Thr Val Gln Thr Asp Lys Val Asp Gly Lys His Phe Ala Leu 630 635 Ala Pro Lys Val Leu Tyr Glu Ala Ser Trp Gln Lys Ile Thr Ile Pro Ala Asn Ser Ser Lys Gln Val Thr Val Pro Ile Asp Ala Ser Arg Phe 665 15 Ser Lys Asp Leu Leu Ala Gln Met Lys Asn Gly Tyr Phe Leu Glu Gly 680 Phe Val Arq Phe Lys Gln Asp Pro Lys Lys Glu Glu Leu Met Ser Ile 695 700 Pro Tyr Ile Gly Phe Arg Gly Asp Phe Gly Asn Leu Ser Ala Leu Glu 710 715 Lys Pro Ile Tyr Asp Ser Lys Asp Gly Ser Ser Tyr Tyr His Glu Ala 730 Asn Ser Asp Ala Lys Asp Gln Leu Asp Gly Asp Gly Leu Gln Phe Tyr 745 25 Ala Leu Lys Asn Asn Phe Thr Ala Leu Thr Thr Glu Ser Asn Pro Trp 760 765 Thr Ile Ile Lys Ala Val Lys Glu Gly Val Glu Asn Ile Glu Asp Ile 775 780 Glu Ser Ser Glu Ile Thr Glu Thr Ile Leu Ala Gly Thr Phe Ala Lys 790 795 Gln Asp Asp Ser His Tyr Tyr Ile His Arg His Ala Asn Gly Lys 805 810 Pro Tyr Ala Ala Ile Ser Pro Asn Gly Asp Gly Asn Arg Asp Tyr Val 820 825 830 35 Gln Phe Gln Gly Thr Phe Leu Arg Asn Ala Lys Asn Leu Val Ala Glu 840 Val Leu Asp Lys Glu Gly Asn Val Val Trp Thr Ser Glu Val Thr Glu 855 860 850 Gln Val Val Lys Asn Tyr Asn Asn Asp Leu Ala Ser Thr Leu Gly Ser 870 875 880 40 865



	Thr	Arg	Phe	Glu	Lys 885	Thr	Arg	Trp	Asp	Gly 890	Lys	Asp	Lys	Asp	Gly 895	Lys
	U a l	Val	Δla	Δsn	Gly	Thr	Tvr	Thr	Tvr		Val	Ara	Tvr	Thr	Pro	Ile
	vai	vai	Alu	900	0_1		-7-		905	5		5	- 2 -	910		
<u>د</u>	Ser	Ser	Glv		Lys	Glu	Gln	His		Asp	Phe	Asp	Val	Ile	Val	Asp
	361		915	7,24	2,5	024	02	920				<b>-</b>	925			•
	NCΩ			Pro	Glu	Val	Ala		Ser	Ala	Thr	Phe		Thr	Glu	asa
	7911	930					935					940				•
	Δτα		ī.en	Thr	Leu	Ala		Lvs	Pro	Lvs	Thr		Gln	Pro	Val	Tyr
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10		Glu	Ara	Ile	Ala		Thr	Tyr	Met	Asp	Glu	qzA	Leu	Pro	Thr	Thr
	AT 9	014			965	- 2 -				970		•			975	
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	1025 Asp Ser	Gln Gly	Ala Gln	Pro Thr 1060	Asp 1045 Pro	1030 Lys S Asp	Lys Lys	Pro Lys	Glu Thr 1069 Thr	Ala 1050 Glu	1035 Lys ) Thr	Pro Lys	Glu Pro	Glu 1070 Gln	Asp 1055 Lys	1040 Gly S Asp
	1025 Asp Ser	Gln Gly Ser	Ala Gln Gly 1075	Pro Thr 1060 Gln	Asp 1045 Pro	Lys Lys Asp	Lys Lys Gly	Pro Lys Lys 1080	Glu Thr 1069 Thr	Ala 1050 Glu 5 Pro	Lys Thr	Pro Lys Lys	Glu Pro Gly 1085	Glu 1070 Gln	Asp 1055 Lys ) Pro	Gly Gly Asp Ser
	1025 Asp Ser	Gln Gly Ser	Ala Gln Gly 1075 Leu	Pro Thr 1060 Gln	Asp 1045 Pro ) Thr	Lys Lys Asp	Lys Lys Gly	Pro Lys Lys 1080	Glu Thr 1069 Thr	Ala 1050 Glu 5 Pro	Lys Thr	Pro Lys Lys	Glu Pro Gly 1085 Ala	Glu 1070 Gln	Asp 1055 Lys ) Pro	Gly Gly Asp Ser
	1025 Asp Ser	Gln Gly Ser Thr	Ala Gln Gly 1075 Leu	Pro Thr 1060 Gln Glu	Asp 1045 Pro ) Thr	Lys Asp Pro	Lys Lys Gly Ser	Pro Lys Lys 1080 Ser	Glu Thr 1069 Thr Lys	Ala 1050 Glu Pro Arg	Lys Thr Gln	Pro Lys Lys Leu 1100	Glu Pro Gly 1089 Ala	Glu 1070 Gln Thr	Asp 1055 Lys ) Pro	Gly  Asp  Ser
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25	Asp Ser Arg Ser 1105	Gln Gly Ser Thr 1090 Thr	Gln Gly 1075 Leu Arg	Pro Thr 1060 Gln Glu Asp	Asp 1045 Pro Thr Lys Gln Lys 1125 Lys	Leu	Lys Lys Gly Ser 1095 Pro Val	Lys Lys 1080 Ser Thr	Glu Thr 1069 Thr Lys Thr	Ala 1050 Glu Pro Arg Asn Thr 1130 Lys	Lys Thr Gln Ala Asp 1115 Phe	Pro Lys Lys Leu 1100 Lys Phe	Glu Pro Gly 1085 Ala ) Asp	Glu 1070 Gln Thr	Asp 1055 Lys Pro Lys Asn Leu 1135	Gly  Asp  Ser  Ala  Arg  1120  Val
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25	Asp Ser Arg Ser 1105	Gln Gly Ser Thr 1090 Thr His	Gln Gly 1075 Leu Arg	Pro Thr 1060 Gln Glu Asp Leu Phe 1140	Asp 1045 Pro Thr Lys Gln Lys 1125 Lys	Leu	Lys Lys Gly Ser 1095 Pro Val	Lys Lys 1080 Ser Thr	Glu Thr 1069 Thr Lys Thr Thr	Ala 1050 Glu Pro Arg Asn Thr 1130 Lys	Lys Thr Gln Ala Asp 1115 Phe	Pro Lys Lys Leu 1100 Lys Phe	Glu Pro Gly 1085 Ala ) Asp	Glu 1070 Gln Thr Thr	Asp 1055 Lys Pro Lys Asn Leu 1135	Gly  Asp  Ser  Ala  Arg  1120  Val
25	Asp Ser Arg Ser 1105	Gln Gly Ser Thr 1090 Thr His	Gln Gly 1075 Leu Arg Leu	Pro Thr 1060 Gln Glu Asp Leu Phe 1140	Asp 1045 Pro Thr Lys Gln Lys 1125 Lys	Leu	Lys Lys Gly Ser 1095 Pro Val	Lys Lys 1080 Ser Thr	Glu Thr 1069 Thr Lys Thr Thr	Ala 1050 Glu Pro Arg Asn Thr 1130 Lys	Lys Thr Gln Ala Asp 1115 Phe	Pro Lys Lys Leu 1100 Lys Phe	Glu Pro Gly 1085 Ala ) Asp	Glu 1070 Gln Thr Thr	Asp 1055 Lys Pro Lys Asn Leu 1135	Gly  Asp  Ser  Ala  Arg  1120  Val

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35	1	5	270	-,5	5	-,-	200			10	Lys	Deu	AIG	110	15	Бец	
		Ser	Thr	Ser		Lev	Leu	Asn	Ala		Ser	Asn	Tle	Lve		Δen	
				20					25					30			
	Thr	Val	Thr	Glu	Asp	Thr	Pro	Ala		Glu	Gln	Ala	Val		Thr	Pro	
			35		- ₽			40					45				
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Thr Pro Gln Thr Pro Asp Asp Ala Glu Glu Thr Ile Ala Asp Asp Ala Asn Asp Leu Ala Pro Gln Ala Pro Ala Lys Thr Ala Asp Thr Pro Ala Thr Ser Lys Ala Thr Ile Arg Asp Leu Asn Asp Pro Ser Gln Val Lys Thr Leu Gln Glu Lys Ala Gly Lys Gly Ala Gly Thr Val Val Ala Val 10 Ile Asp Ala Gly Phe Asp Lys Asn His Glu Ala Trp Arg Leu Thr Asp Lys Thr Lys Ala Arg Tyr Gln Ser Lys Glu Asp Leu Glu Lys Ala Lys Lys Glu His Gly Ile Thr Tyr Gly Glu Trp Val Asn Asp Lys Val Ala Tyr Tyr His Asp Tyr Ser Lys Asp Gly Lys Thr Ala Val Asp Gln Glu His Gly Thr His Val Ser Gly Ile Leu Ser Gly Asn Ala Pro Ser Glu 20 Thr Lys Glu Pro Tyr Arg Leu Glu Gly Ala Met Pro Glu Ala Gln Leu Leu Leu Met Arg Val Glu Ile Val Asn Gly Leu Ala Asp Tyr Ala Arg Asn Tyr Ala Gln Ala Ile Ile Asp Ala Val Asn Leu Gly Ala Lys Val Ile Asn Met Ser Phe Gly Asn Ala Ala Leu Ala Tyr Ala Asn Leu Pro Asp Glu Thr Lys Lys Ala Phe Asp Tyr Ala Lys Ser Lys Gly Val Ser 30 Ile Val Thr Ser Ala Gly Asn Asp Ser Ser Phe Gly Gly Lys Thr Arg Leu Pro Leu Ala Asp His Pro Asp Tyr Gly Val Val Gly Thr Pro Ala Ala Ala Asp Ser Thr Leu Thr Val Ala Ser Tyr Ser Pro Asp Lys Gln Leu Thr Glu Thr Ala Thr Val Lys Thr Ala Asp Gln Gln Asp Lys Glu Met Pro Val Leu Ser Thr Asn Arg Phe Glu Pro Asn Lys Ala Tyr Asp 40 Tyr Ala Tyr Ala Asn Arg Gly Met Lys Glu Asp Asp Phe Lys Asp Val



Lys Gly Lys Ile Ala Leu Ile Glu Arg Gly Asp Ile Asp Phe Lys Asp Lys Ile Ala Asn Ala Lys Lys Ala Gly Ala Val Gly Val Leu Ile Tyr Asp Asn Gln Asp Lys Gly Phe Pro Ile Glu Leu Pro Asn Val Asp Gln Met Pro Ala Ala Phe Ile Ser Arg Lys Asp Gly Leu Leu Lys Glu 10 Asn Pro Gln Lys Thr Ile Thr Phe Asn Ala Thr Pro Lys Val Leu Pro Thr Ala Ser Gly Thr Lys Leu Ser Arg Phe Ser Ser Trp Gly Leu Thr Ala Asp Gly Asn Ile Lys Pro Asp Ile Ala Ala Pro Gly Gln Asp Ile Leu Ser Ser Val Ala Asn Asn Lys Tyr Ala Lys Leu Ser Gly Thr Ser Met Ser Ala Pro Leu Val Ala Gly Ile Met Gly Leu Leu Gln Lys Gln 20 Tyr Glu Thr Gln Tyr Pro Asp Met Thr Pro Ser Glu Arg Leu Asp Leu Ala Lys Lys Val Leu Met Ser Ser Ala Thr Ala Leu Tyr Asp Glu Asp Glu Lys Ala Tyr Phe Ser Pro Arg Gln Gln Gly Ala Gly Ala Val Asp Ala Lys Lys Ala Ser Ala Ala Thr Met Tyr Val Thr Asp Lys Asp Asn Thr Ser Ser Lys Val His Leu Asn Asn Val Ser Asp Lys Phe Glu Val 30 Thr Val Thr Val His Asn Lys Ser Asp Lys Pro Gln Glu Leu Tyr Tyr Gln Ala Thr Val Gln Thr Asp Lys Val Asp Gly Lys Leu Phe Ala Leu Ala Pro Lys Ala Leu Tyr Glu Ala Ser Trp Gln Lys Ile Thr Ile Pro Ala Asn Ser Ser Lys Gln Val Thr Ile Pro Ile Asp Val Ser Gln Phe Ser Lys Asp Leu Leu Ala Pro Met Lys Asn Gly Tyr Phe Leu Glu Gly 40 Phe Val Arg Phe Lys Gln Asp Pro Thr Lys Glu Glu Leu Met Ser Ile



Pro Tyr Ile Gly Phe Arg Gly Asp Phe Gly Asn Leu Ser Ala Leu Glu Lys Pro Ile Tyr Asp Ser Lys Asp Gly Ser Ser Tyr Tyr His Glu Ala Asn Ser Asp Ala Lys Asp Gln Leu Asp Gly Asp Gly Leu Gln Phe Tyr Ala Leu Lys Asn Asn Phe Thr Ala Leu Thr Thr Glu Ser Asn Pro Trp 10 Thr Ile Ile Lys Ala Val Lys Glu Gly Val Glu Asn Ile Glu Asp Ile Glu Ser Ser Glu Ile Thr Glu Thr Ile Phe Ala Gly Thr Phe Ala Lys Gln Asp Asp Ser His Tyr Tyr Ile His Arg His Ala Asn Gly Lys Pro Tyr Ala Ala Ile Ser Pro Asn Gly Asp Gly Asn Arg Asp Tyr Val Gln Phe Gln Gly Thr Phe Leu Arg Asn Ala Lys Asn Leu Val Ala Glu 20 Val Leu Asp Lys Glu Gly Asn Val Val Trp Thr Ser Glu Val Thr Glu Gln Val Val Lys Asn Tyr Asn Asn Asp Leu Ala Ser Thr Leu Gly Ser Thr Arg Phe Glu Lys Thr Arg Trp Asp Gly Lys Asp Lys Asp Gly Lys Val Val Ala Asn Gly Thr Tyr Thr Tyr Arg Val Arg Tyr Thr Pro Ile Ser Ser Gly Ala Lys Glu Gln His Thr Asp Phe Asp Val Ile Val Asp 30 Asn Thr Thr Pro Glu Val Ala Thr Ser Ala Thr Phe Ser Thr Glu Asp Arg Arg Leu Thr Leu Ala Ser Lys Pro Lys Thr Ser Gln Pro Val Tyr Arg Glu Arg Ile Ala Tyr Thr Tyr Met Asp Glu Asp Leu Pro Thr Thr Glu Tyr Ile Ser Pro Asn Glu Asp Gly Thr Phe Thr Leu Pro Glu Glu Ala Glu Thr Met Glu Gly Ala Thr Val Pro Leu Lys Met Ser Asp Phe 40 Thr Tyr Val Val Glu Asp Met Ala Gly Asn Ile Thr Tyr Thr Pro Val

1020

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1015

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